stantly, whilst its flow velocity remains unchanged, curve portions as those indicated at a_4—a_5, b_4—b_5 and c_4—c_5 are recorded.

Assuming that the water level remains unchanged during a subsequent period, during which the flow velocity drops constantly to a zero value and thereafter to a negative value, according to line b_5—b_{5-6}—b_6, line a_5—a_6 will be a horizontal straight line, whilst line c_5—c_6 will be composed of three parabolic portions. Point c_{5-6} corresponds to velocity zero, the return point at the lower edge of the tape being caused by pin **138** passing from the right-handed groove on drum **97** to the left-handed groove thereon (or inversely). To calculate the hydrodynamic pressure difference between points c_5 and c_6, one has merely to add the heights of these points above the horizontal line passing through the return point.

If thereafter the level of the river is lowered constantly, whilst the flow velocity remains unchanged, the curve a_6—a_7 may be formed as shown, with a return point a_{6-7} caused by pin **138** reaching the lower end of the drum **96**. The difference of levels may again be obtained by adding the diagram heights a_6, a_7. The velocity curve is represented by a horizontal line b_6—b_7, whilst line c_6—c_7 is an inclined straight line.

It is easily to be understood that variations of the level of say 1 millimeter may produce a movement of the slides **126** and **128** over 10 millimeters, for example, so that the measuring accuracy is very great. A similar accuracy may be obtained in the velocity-measurement.

Whilst in the above discussions simple changes of the water level and of the flow velocity were assumed for the sake of clarity of explanation, it is obvious that the changes of water level and of water velocity may occur simultaneously and independently of each other in any manner without changing the method of operation of the apparatus. It is an object of the present invention to provide means for recording the curves indicating the variations of the water level, of those of the water velocity and of those of the level summarized with those of the hydrodynamic pressure, on a single tape, the curves instantaneously illustrating the changes of flow conditions of the river.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining and that various rearrangements of parts and modifications of details may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What I claim is:

1. An apparatus for measuring levels of non-conductor liquids, comprising in combination, a stationary revolvable shaft, an insulating drum rigidly connected to said shaft, two metallic wires having each an end portion wound on said drum, two contact rods individually suspended on and connected to the other ends of said wires, a float having a chamber communicating with the liquid and having a bottom wall comprising a depressed portion, an electrically conductive liquid in said depressed portion and adapted to be engaged by said contact rods, two slip rings fixed on said drum and individually connected with said wire portions, two fixed brushes individually engaging said slip rings, a relay having a coil, electric conduit means comprising said conductive liquid, said contact rods, said wires, said slip rings, said brushes, said relay coil, and a current source, reversible rotary driving means for said shaft connected with said relay for controlling the direction of rotation of said shaft for lowering said contact rods when said circuit means are not current-carrying and for raising said contact rods when said circuit means are current-carrying, and means indicating the extent of rotation of said shaft.

2. An apparatus for measuring the level, the velocity, and the volume of an electrically conductive liquid flowing through a channel, comprising in combination, a Pitot tube; two liquid level measuring apparatus, one for measuring the level of the flowing liquid, the other for measuring the level of the liquid in said Pitot tube, each of these two apparatus comprising a stationary revolvable shaft, an insulating drum rigidly connected to said stationary shaft, a metallic wire having an end portion wound on said drum, a contact rod suspended on the other end of said wire, a slip ring on said drum, connected to said wire portion, a fixed brush engaging said slip ring, a relay having a coil, electric circuit means comprising means permanently in contact with said liquid, said contact rod, said wire, said slip ring, said brush, said relay coil, and a current source, reversible rotary driving means for said stationary shaft connected with said relay for controlling the direction of rotation of said shaft for lowering said contact rod when said circuit means are not current-carrying and for raising said contact rod when said circuit means are current-carrying, an actuating drum operatively connected with said insulating drum to be rotated therewith, a stylus-carrying slide guided for movement in a direction parallel to the rotation axis of said actuating drum; a third actuating drum operatively connected with the actuating drum of the apparatus measuring the level of the liquid to be rotated with said last mentioned drum, a helicoidal groove having a parabolic pitch on said third drum; a sleeve coaxial with and surrounding said third drum and operatively connected with the actuating drum of the apparatus measuring the level of the liquid in said Pitot tube so as to be rotated with said actuating drum, said sleeve having a longitudinal slot; a ring surrounding said sleeve and being coaxial slidable thereon and having a circumferential groove; a pin being fixed to said ring, traversing said longitudinal slot and engaging the groove on the third actuating drum, a third stylus-carrying slide guided to move parallel to the rotation axis of said third drum and engaging said circumferential groove, a recorder-tape arranged for engagement by the stylus of said three stylus-carrying slides, and means for advancing said recorder-tape in a direction substantially perpendicular to the paths of said stylus-carrying slides.

3. An apparatus according to claim 2, said driving means comprising an electric-motor having a driving shaft, a transversal shaft, a worm gearing interconnecting said driving shaft with said transversal shaft, bevel gears rigidly fixed to both ends of said transversal shaft, two drum shafts perpendicular to said transversal shaft and individually rigidly connected with said first two actuating drums, and two pairs of bevel gears individually loosely mounted on said drum shafts and individually meshing with said bevel gears, two pairs of electromagnetic clutches in-